

Primary Aluminum - Background Information for
Promulgated Amendments

(U.S.) Environmental Protection Agency
Research Triangle Park, NC

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United States
Environmental Protection
Agency

Office of Air Quality
Planning and Standards
Research Triangle Park NC 27711

EPA 450/3-79-026
March 1980

Air

PB80-192479



Primary Aluminum — Background Information for Promulgated Amendments

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TECHNICAL REPORT DATA (Please read instructions on the reverse before completing)		
1. REPORT NO. EPA 450/3-79-026	2.	3. RECIPIENT'S ACCESSION NO. PB 80 192479
4. TITLE AND SUBTITLE Primary Aluminum - Background Information for Promulgated Amendments	5. REPORT DATE March 1980	6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S)	8. PERFORMING ORGANIZATION REPORT NO.	
9. PERFORMING ORGANIZATION NAME AND ADDRESS Standards Development Branch Emission Standards and Engineering Division Office of Air Quality Planning and Standards Research Triangle Park, NC 27711	10. PROGRAM ELEMENT NO.	11. CONTRACT/GRANT NO.
12. SPONSORING AGENCY NAME AND ADDRESS DAA for Air Quality Planning and Standards Office of Air, Noise and Radiation U.S. Environmental Protection Agency Research Triangle Park, NC 27711	13. TYPE OF REPORT AND PERIOD COVERED	14. SPONSORING AGENCY CODE EPA/200/04
15. SUPPLEMENTARY NOTES		
16. ABSTRACT This document summarizes and responds to comments submitted by the public on the proposed amendments to the standards of performance for new primary aluminum plants. The standards and amendments are intended to limit emissions of gaseous and particulate fluorides into the atmosphere. The document also presents the final environmental, economic, and energy impacts of the final amendments.		
17. KEY WORDS AND DOCUMENT ANALYSIS		
a. DESCRIPTORS Air pollution Pollution control Standards of performance Primary aluminum plants Fluorides Aluminum	b. IDENTIFIERS/OPEN ENDED TERMS Air pollution control	c. COSATI Field/Group 13B
18. DISTRIBUTION STATEMENT Unlimited	19. SECURITY CLASS (This Report) Unclassified 20. SECURITY CLASS (This page) Unclassified	21. NO. OF PAGES 22. PRICE

EPA-450/3-79-026

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Emission Standards and Engineering Division

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Air, Noise, and Radiation
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

March 1980

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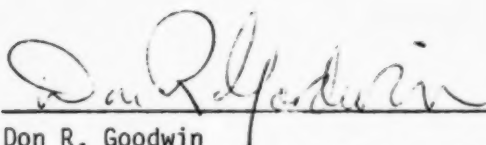
This report has been reviewed by the Emission Standards and Engineering Division, Office of Air Quality Planning and Standards, Office of Air, Noise, and Radiation, Environmental Protection Agency, and approved for publication. Mention of company or product names does not constitute endorsement by EPA. Copies of this report are available through the Library Services Office (MD-35), U.S. Environmental Protection Agency, Research Triangle Park, N.C. 27711; or may be obtained, for a fee, from the National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22161.

Publication No. EPA-450/3-79-026

Background Information
and Final
Environmental Impact Statement
for
Primary Aluminum Plant Amendments

Type of Action: Administrative

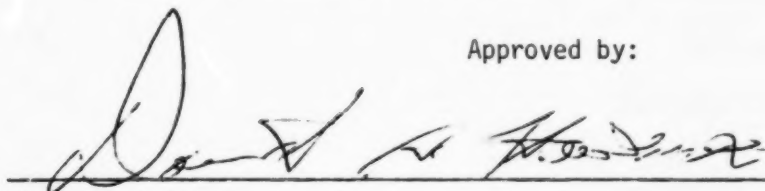
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5/11/80
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Final Environmental Impact Statement submitted to
EPA's Office of Federal Activities on

April 1980
(Date)

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PRIMARY ALUMINUM
BACKGROUND INFORMATION: PROMULGATED AMENDMENTS

Table of Contents

	<u>Page</u>
1. INTRODUCTION	1
2. COMMENTS AND RESPONSES	3
2.1 Introduction	3
2.2 List of Commenters	3
2.3 Summary of Public Comments and EPA Responses	4
3. ENVIRONMENTAL, ECONOMIC, AND ENERGY IMPACTS	23

1. INTRODUCTION

On September 19, 1978, the U.S. Environmental Protection Agency (EPA) proposed amendments to the standards of performance for new primary aluminum plants (43 FR 42186)¹. The standards and amendments are intended to limit emissions of gaseous and particulate fluorides into the atmosphere. Also proposed on September 19 were revisions to Reference Method 14 for measuring fluoride emission rates from primary aluminum plants. The purpose of this document is to summarize and discuss comments submitted by the public on the September 19 proposal, and to present the environmental, economic, and energy impacts of the final amendments.

The standards of performance, including Reference Method 14, were originally proposed on October 23, 1974 (39 FR 37730), and promulgated on January 26, 1976 (41 FR 3826). Accompanying these standards were three documents, entitled Background Information for Standards of Performance: Primary Aluminum Industry - Volume 1: Proposed Standards (Report Number EPA 450/2-74-020a); Volume 2: Test Data Summary (EPA 450/2-74-020b); and Volume 3: Supplemental Information (EPA 450/2-74-020c). Also, in 1977 EPA published the results of an emission test program, entitled Air Pollution Emission Test, The Anaconda Company Sebree Reduction Plant, Henderson, Kentucky (Report

¹This refers to Volume 43, page 42186, of the Federal Register.

Number 77-ALR-6). This test program was used in developing the proposed amendments and revisions. Supplemental information for the proposed amendments is contained in another document, entitled Primary Aluminum Background Information: Proposed Amendments (EPA 450/2-78-025a). All of the Federal Register notices and documents noted above may be obtained from the U.S. EPA Library (MD-35), Research Triangle Park, N.C. 27711, telephone (919) 541-2777. The final amendments and revisions have been published in the Federal Register concurrently with the publication of this document. Both may be obtained from the EPA library.

2. SUMMARY OF PUBLIC COMMENTS AND EPA RESPONSES

2.1 INTRODUCTION

Upon proposal of the primary aluminum amendments and Reference Method 14 revisions, the public was invited to participate in the rulemaking process by submitting comments to EPA's Emission Standards and Engineering Division. Five comment letters and two telephone calls were received. Also, a telephone call was placed to a representative of a primary aluminum company to ask for information on anemometer calibration. The comment letters and records of telephone calls may be reviewed in EPA's docket for the primary aluminum amendments (docket number OAQPS-78-10).

All of the comments were reviewed and were useful in developing the final amendments. A list of commenters and a discussion of significant comments appear below.

2.2 LIST OF COMMENTERS

<u>Commenter and Organization</u>	<u>Docket Identification</u>
Indra Jashnani Martin Marietta Company Baltimore, Maryland	IV-D-1
Joseph E. Gibb Aluminum Company of America Alcoa Center, Pennsylvania	-2

Bill Stewart Texas Air Control Board Austin, Texas	-3
Frank S. Lisella Public Health Service Atlanta, Georgia	-4
Lawrence C. Tropea, Jr. Reynolds Metals Company Richmond, Virginia	-5
Donald W. Everett The Anaconda Company Louisville, Kentucky	-6
Jim Yeager ¹ Anaconda Aluminum Division Louisville, Kentucky	-7
John Prohaska S. C. Department of Health and Environmental Control Columbia, South Carolina	-8

2.3 SUMMARY OF PUBLIC COMMENTS AND EPA RESPONSES

Monthly Performance Testing

COMMENT: The proposed amendments would require performance testing at least once each month throughout the life of a new primary aluminum plant. This requirement would impose a very large economic burden on the plant. For example, EPA's figures indicate that monthly testing would require \$156,000 per year in addition to the large capital investment and operating expenses required for the control systems themselves. Testing at intervals less frequent than monthly should be sufficient to determine whether a new plant is complying with the standards. The proposed amendments would impose onerous, expensive, and unnecessary testing requirements on well-controlled

¹Mr. Yeager was contacted and asked to provide information on anemometer calibration.

plants. Several possible alternatives to the proposed monthly testing requirement are as follows:

(1) An initial performance test, as originally required under 40 CFR 60.8(f)¹, would be sufficient to demonstrate compliance. Periodic visual inspections could then be used to determine whether the control systems were being properly maintained. If the visual inspections indicated that maintenance was poor, monthly testing could then be required. This procedure would not impose the burden of monthly testing on the entire industry.

(2) Criteria should be established for determining when monthly testing is necessary. For example, testing could be performed on a six-month basis until a violation occurred, when testing would revert to a monthly schedule.

(3) The provisions permitting the Administrator, upon application, to establish an alternative test schedule for primary and bake plant emissions could be extended to include secondary emissions. For example, quarterly testing of secondary emissions could be required until a violation occurred. Monthly testing could then be invoked for some period of time, possibly six months, until emissions were once again consistently below the level of the standard. Quarterly testing would then resume.

RESPONSE: While developing the proposed amendments, it was found that the operation and maintenance of aluminum plant emission control systems had seriously deteriorated during the past several years. The Administrator believes that regular emission testing will help remedy

¹This refers to Title 40, section 60.8(f) of the Code of Federal Regulations.

plants. Several possible alternatives to the proposed monthly testing requirement are as follows:

(1) An initial performance test, as originally required under 40 CFR 60.8(f)¹, would be sufficient to demonstrate compliance. Periodic visual inspections could then be used to determine whether the control systems were being properly maintained. If the visual inspections indicated that maintenance was poor, monthly testing could then be required. This procedure would not impose the burden of monthly testing on the entire industry.

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¹This refers to Title 40, section 60.8(f) of the Code of Federal Regulations.

this situation by providing an incentive for good operation and maintenance throughout the life of the plant. Monthly testing was selected as a compromise between other testing options. Weekly testing, for example, would ensure better operation and maintenance than monthly testing, but at a much greater cost. Alternatively, quarterly or yearly testing would be less expensive, but would not have ensured an adequate level of maintenance. Monthly testing, on the other hand, will ensure satisfactory operation and maintenance of the emission control systems at a reasonable cost.

In evaluating criticism of the proposed monthly testing requirement, the Administrator focused his attention on costs. Since the cost of the monthly testing requirement, at less than 0.5 percent of the annualized costs of a typical primary aluminum plant, is so small, the Administrator could not justify changing the proposed monthly testing requirement. More information on costs appears in Chapter 3.

Concerning the three recommended alternatives to monthly testing, the Administrator does not feel that any can be implemented. EPA does not have enough trained personnel to perform periodic visual inspections, as recommended under alternative number (1). Also, visual inspections would not always guarantee that the entire emission control system was operating properly. Alternatives number (2) and (3) would not accomplish the goal of monthly testing of secondary emissions. The Administrator believes that testing as often as once each month is necessary to ensure an adequate level of maintenance between tests.

Performance Check Of Anemometers Following Each Test Series

COMMENT: The proposed Reference Method 14 revisions would require a performance check of the propeller anemometers to be conducted after

each series of three test runs. These requirements could lead to substantially increased costs in the sampling program when there are a number of anemometers to be removed and recalibrated every month. Do factual data exist which support the need to conduct performance checks as frequently as every month, or would quarterly checks serve the same purpose?

RESPONSE: The requirement to check the performance of the propeller anemometers after each series of three test runs was selected to provide the best possible information for performance testing. Review of calibration and cost data, however, indicates that anemometer calibration checks as often as every month are unnecessary, and that yearly checks would be adequate. Section 4 of Reference Method 14 has been revised to require an anemometer performance check 12 months after the initial anemometer installation. The results of this performance check will be used to determine the schedule of subsequent performance checks.

Recalculation of Average Velocity

COMMENT: If an anemometer fails a performance check, Section 4.1.2.4 of the proposed Reference Method 14 revisions would allow recalculated values of the average velocity (v) to be used in recomputing the overall average velocity and total flowrate. This procedure would only be allowed, however, in situations where recalculation of v would lead to higher calculated emission rates. No similar provision exists for recalculating v in situations where doing so would lead to lower emission levels. This appears to represent a double standard. It would be more logical to recalculate v for all situations, regardless of whether the

calculated emission rates would increase or decrease. Alternatively, it would be logical to not allow v to be recalculated in any situation since there is no reason to believe that the accuracy of measurement would change with the direction of error.

RESPONSE: This proposed requirement has been deleted from the final Reference Method 14 revisions because of changes in the test method which allow longer intervals between post-test performance checks.

Use of Single Sampling Train for Entire 24-Hour Test Run

COMMENT: The proposed Reference Method 14 revisions, by reference to Methods 13A and 13B, would require a single sampling train to be used throughout an entire test run. It would be impossible to comply with this requirement, however, without overloading the silica gel impinger. Should the impinger be changed during the test run or should the entire sampling train be replaced?

RESPONSE: Revisions of Methods 13A and 13B which will clarify this question are under final development. Similar revisions to Method 5 have already been finalized (42 FR 41754).

Anemometer Installation at Point of Average Velocity

COMMENT: Section 2.1.2.3 of the proposed Reference Method 14 revisions directs the owner or operator of a plant to install the anemometers at a point of average velocity as determined by a traverse of the roof opening. Our experience with hand-measured velocity measurements across a roof opening confirms that the point of average velocity varies with every change in wind direction or speed; and at low

velocity winds, this happens in as little as 15-minute intervals at the extreme. Other aluminum companies confirm our test results which indicate that as much as 10 percent of the time air actually enters the building through the roof. It is recommended that the anemometers be located in the center of the roof opening, as far as possible from any adjacent support structure.

RESPONSE: We agree with the recommendation. Section 2.1.2.3 has been revised to allow, as an option, the owner or operator to install the anemometers halfway across the width of the roof monitor.

Balancing of Sampling Manifold

COMMENT: Section 4.2 of the proposed Reference Method 14 revisions appears to require the sampling manifold to be mounted in the center of the roof opening and to be balanced for flow rate after the potline has commenced operation. It is recommended that this section be rewritten to allow the balancing of the manifold to be based on the design flow of the building. The manifold can be installed on scaffolding at the down-comer blower in the courtyard. By adjusting the blower to an average volume, as determined from building design or measured averages of similar rooms, each of the eight manifold nozzles can be adjusted with a pitot tube so that each nozzle draws air at equal velocities. The adjustable gates can then be permanently sealed. This can all be done and the manifold installed permanently in the roof opening before the crane is required to service the operating cells.

RESPONSE: This recommendation has been incorporated into the final Reference Method 14 revisions.

Anemometer Placement in Segmented Roof Monitors

COMMENT: Section 2.1.2 of the proposed Reference Method 14 revisions requires that roof monitors less than 130 meters in length use at least two anemometers. Although some roof monitors are longer than 130 meters, the individual monitor segments may not be. We have considered that one anemometer would be required for each 85 meters; and as the segmented roof monitors are less than 85 meters in length, we have typically been using only one anemometer per segment. It is recommended that the proposed amendments be clarified to state that only one anemometer would be required in a segmented roof monitor.

RESPONSE: EPA's experience at the Sebree plant shows that the use of one anemometer would probably yield erroneous results. Consequently, the Administrator believes that use of only one anemometer in a segmented roof monitor should not be allowed. In special situations, however, the Administrator may approve the use of one anemometer as an alternative procedure.

Performance Testing at Modified Existing Plants

COMMENT: If an existing plant is modified to such an extent that it becomes subject to performance standards for new sources, and if the plant has secondary emission controls (i.e., roof scrubbers), then the use of Reference Method 14 for sampling emissions would be impractical. This is because Method 14 would require installation of a sampling manifold in the area of the roof monitor occupied by the scrubbers.

RESPONSE: If it can be demonstrated that the use of Reference Method 14 in a modified existing plant would be impractical, 40 CFR 60.8(d) of the General Provisions permit the owner or operator to apply

to the Administrator for a waiver from the testing requirement or for permission to use an alternative testing procedure.

Proposed Emission Limit for Soderberg Plants

COMMENT: The original standards required potroom emissions to be below 0.95 kg/Mg (1.9 lb/ton) for prebake plants and below 1.0 kg/Mg (2.0 lb/ton) for Soderberg plants. The 0.05 kg/Mg (0.1 lb/ton) difference between the standards was reasonable in view of the difference between the two types of plants. EPA has erred in not following this same reasoning in developing the proposed never-to-be-exceeded limit of 1.25 kg/Mg (2.5 lb/ton) which applies to both prebake and Soderberg plants. It is recommended that a never-to-be-exceeded limit of 1.3 kg/Mg (2.6 lb/ton) be established for Soderberg plants while retaining the proposed 1.25 kg/Mg (2.5 lb/ton) limit for prebake plants.

RESPONSE: This recommendation has been incorporated into the final amendments.

Compliance With Proposed 1.25 kg/Mg (2.5 lb/ton) Limit

COMMENT: The preamble to the proposed amendments states, "...under no circumstances, however, would performance test results be allowed above 1.25 kg/Mg (2.5 lb/ton)." This statement could be construed to mean that each individual test run, rather than the average of three runs, must be below the proposed 1.25 kg/Mg limit. This should be clarified in the final preamble and regulation.

RESPONSE: The preamble to the proposed amendments notes that, "a performance test is defined in 40 CFR 60.8(f) as the arithmetic mean of three separate test runs, except in situations where a run must be discounted or canceled and the Administrator approves using the

arithmetic mean of two runs". This will be repeated in the preamble to the final amendments.

Use of Tapping Crucibles With Aspirator Air Return Systems

COMMENT: The preamble to the proposed amendments states, "...only tapping crucibles with functional aspirator air return systems (for returning gases under the collection hooding) should be used..." This recommendation is totally unnecessary in cases where a company can, with an alternate tapping procedure, achieve compliance with the emission standards. Furthermore, the recommendation may encourage a state environmental protection agency or an EPA Regional Office to unnecessarily require a company to modify its existing tapping practices. The recommendation to return aspirator gases under the hooding should be deleted. Alternatively, the recommendation should be adhered to only where it is consistent with company tapping practices or necessary to achieve compliance.

RESPONSE: The proposal preamble states that certain operating and maintenance procedures, including the use of aspirator air return systems, are exemplary of good emission control and should be implemented. Although this statement reflects the Administrator's judgment about which procedures would enable the standards to be achieved, the regulation itself does not actually require those procedures to be implemented.

If emissions are below 0.95 kg/Mg (1.9 lb/ton) for prebake potrooms and 1.0 kg/Mg (2.0 lb/ton) for Soderberg potrooms, any combination of procedures may be used. If emission levels are between 0.95 and 1.25 kg/Mg (1.9 and 2.5 lb/ton) for prebake potrooms or 1.0 and 1.3 kg/Mg

(2.0 and 2.6 lb/ton) for Soderberg potrooms the regulation requires the owner or operator of a plant to demonstrate that exemplary operating and maintenance procedures are used. Otherwise, a violation of the standard would occur. The Administrator has not defined exemplary operating and maintenance procedures in the regulation because different plants, depending on plant design, may incorporate different procedures. Instead, the Administrator believes that exemplary operating and maintenance procedures for a particular plant should be determined by EPA on a case-by-case basis. A plant should not be required to use aspirator air return systems (or the remaining techniques noted in the preamble to the proposed amendments) if the standards can be achieved with other procedures.

Performance Testing of Primary and Bake Plant Emissions

COMMENT: The proposed amendments would allow relief from the monthly testing requirements for primary and bake plant emissions only if the contribution of the primary and bake plant emissions to the total emission rate averages about 2.5 and 5.0 percent, respectively. These proposed percentage requirements are arbitrary and unnecessary, and their adoption would prevent many well-controlled plants from obtaining an exemption. The key issue here is the variability of emissions and whether primary and bake plant emissions are predictable, not whether they contribute some arbitrary percentage to overall plant emissions. It is recommended that EPA delete from the amendments the percentage guidelines and instead require the owner or operator of a plant to show that the primary and/or carbon bake plant emissions are predictable. Under this approach, exemptions would be granted in cases where emissions from the primary and bake plant control systems are greater than 2.5 and

5.0 percent, respectively, if it can be demonstrated that the emission levels from these systems can be accurately predicted.

RESPONSE: The commenter has misunderstood the preamble to the proposed amendments. The percentages mentioned in the preamble are neither guidelines nor requirements, but are intended to help justify EPA's position that testing of the primary control system and bake plant as often as once each month may be unreasonable. The preamble states:

The proposed amendments would allow the owner or operator of a new plant to apply to the Administrator for an exemption from the monthly testing requirement for the primary control system and the anode bake plant. EPA believes that the testing of these systems as often as once each month may be unreasonable given that (1) The contribution of primary and bake plant emissions to the total emission rate is minor, averaging about 2.5 and 5 percent, respectively; (2) primary and bake plant emissions are much less variable than secondary emissions; and (3) the cost of primary and bake plant emissions sampling is high. An application to Administrator for an exemption from monthly testing would be required to include (1) evidence that the primary and bake plant emissions have low variability; (2) an alternative testing schedule; and (3) a representative value for primary emissions to be used in total fluoride emission calculations.

The regulation states:

An owner or operator may petition the Administrator to establish an alternative testing requirement that requires testing less frequently than once each month for a primary control system or an anode bake plant. If the owner or operator shows that emissions from the primary control system or the anode bake plant have low variability during day-to-day operations, the Administrator may establish such an alternative testing requirement. The alternative testing requirement shall include a testing schedule and, in the case of a primary control system, the method to be used to determine primary control system emissions for the purpose of performance tests. The Administrator shall publish the alternative testing requirement in the Federal Register.

Note that neither the preamble nor the regulation requires primary or bake plant emissions to be a percentage of total emissions.

Permanent Manifold and Anemometer Installations

COMMENT: Section 1.1 of the proposed Reference Method 14 revisions requires that manifolds and anemometers be permanently installed in each potroom group. Depending upon the number of installations required at the plant, it might be more economical not to permanently mount the anemometers, but to have specific locations for anemometers to be placed before test runs are performed; and to move them from potroom group to potroom group as required.

RESPONSE: Based on this recommendation, the final Reference Method 14 revisions do not require the anemometers to be permanently installed.

Definition of Performance Test

COMMENT: A performance test is currently defined in 40 CFR 60.8(f) as the arithmetic mean of three separate test runs. Separate runs are not cost-effective and create manpower and morale problems. Three consecutive runs are more efficient, accurate, and representative of an aluminum reduction operation. During the cooperative EPA test program at the Anaconda aluminum reduction plant in Sebree, Kentucky, the efficacy of consecutive runs was discussed with EPA and agreed to. It is recommended that 40 CFR 60.8(f) be modified to provide for the arithmetic mean of three consecutive test runs.

RESPONSE: The term "separate" means that the results of the test runs are to be calculated individually. This does not prevent the three test runs from being conducted consecutively. In the case of

emission testing at primary aluminum plants, it would be logical to conduct the tests consecutively due to the duration and complexity of the tests. This will be clarified in the preamble to the final amendments.

Duration of Test Runs

COMMENT: Section 5.3.4 of the proposed Reference Method 14 revisions specifies an 8-hour period for each test run. This time period appears to be inconsistent with the 24-hour period stated on page 42187 of the preamble to the proposed regulation.

RESPONSE: The new aluminum plants EPA has examined operate on 24-hour cycles; that is, 24 hours are required for the major potroom operations and events to occur in the area beneath the sampling manifold. Consequently, the cost estimates located on page 42187 of the preamble were based on 24-hour emission sampling periods. It is essential that the sampling period represent all potroom operations and events, including tapping, carbon setting, and tracking. This is not inconsistent with Section 5.3.4 of Reference Method 14 which states:

Each test run shall last 8 hours or more; if more than one run is to be performed, all runs shall be of approximately the same (+ 10 percent) length. If question exists as to the representativeness of an 8-hour test, a longer period may be selected. Conduct each run during a period when all normal operations are performed underneath the sampling manifold. During the test period, all pots in the potroom group shall be operated such that emissions are representative of normal operating conditions in the potroom group. (Emphasis added.)

Definition of Potroom Group

COMMENT: The proposed definition of potroom group would require many sampling manifolds to be installed in plants where only a few

pots are ducted to a primary control system. Some existing plants utilize as many as 36 individual primary control systems. The proposed definition would require 36 sampling manifolds to be installed in similarly designed new plants. This would be unnecessary and wasteful. It is recommended that the proposed amendments be revised such that only one sampling manifold is required for each pot type, provided that similar operating practices are employed. Similar types of pots operated in the same plant by the same supervisory management would have similar roof monitor emissions. Thus, it would not be necessary to sample emissions throughout the entire plant. Simple visual inspections of pot hooding in potroom areas where testing is not conducted would reveal whether the hooding is maintained as well as in potroom areas where testing is conducted.

RESPONSE: The definition of potroom group is based on the design of the Anaconda plant in Sebree, Kentucky, and on similar plants where only two primary control systems are associated with each potline. Plants planned for the future are expected to be similarly designed. If a new or modified plant is designed differently, and if it can be demonstrated that testing of the plant would be impractical and costly due to a large number of primary control systems, then the Administrator would approve, upon application, an alternative test procedure.

Although some existing plants use as many as 36 individual primary control systems, it is emphasized that these regulations do not apply to existing plants. If testing is to be conducted at an existing plant which is significantly different in design from the Sebree plant, alternate test procedures should be developed.

Prior Notice of Performance Tests

COMMENT: Under 40 CFR 60.8(d) it is assumed that the 30-day prior notice of any performance test is limited to the initial test required to obtain an operating permit. Thereafter, the seven-day notice of performance tests, as required under section 60.195 of the proposed amendments, would apply to monthly testing. Is this assumption correct?

RESPONSE: Yes. 40 CFR 60.8(d) has been revised to read as follows:

The owner or operator of an affected facility shall provide the Administrator at least 30 days prior notice of any performance test, except as specified under other subparts, to afford the Administrator the opportunity to have an observer present. (44 FR 33580)

The amended regulation for new primary aluminum plants (40 CFR 60, Subpart S) states:

Following the initial performance test as required under §60.8(a), an owner or operator shall conduct a performance test at least once each month during the life of the affected facility, except when malfunctions prevent representative sampling, as provided under §60.8(c). The owner or operator shall give the Administrator at least seven days advance notice of each test. The Administrator may require additional testing under section 114 of the Clean Air Act.

Calculation of Aluminum Production Rate

COMMENT: Since production records are compiled on a monthly basis, section 60.195(f) of the proposed amendments for determining production rates would cause unnecessary recordkeeping. It is recommended that the section be revised as follows:

The rate of aluminum production is determined by dividing the number of hours in the month into the weight of aluminum tapped from the affected facility during the month in which the performance test was performed.

RESPONSE: If the rate of aluminum production were determined on a calendar-month basis, as the commenter suggests, then in situations where testing is conducted at the beginning of a month, the final test results would not be known until the end of the month. This delay could allow emissions to be above the standard for nearly an entire month before a violation could be determined and corrective actions taken. It is preferable that the test results be known as soon as possible after the testing is completed, as provided for in the proposed and final regulations.

Metric Units of Measure

COMMENT: The duct work described in the proposal is defined in terms of metric units of measure which do not correspond to American standard sizes. This may cause an additional inflationary impact.

RESPONSE: Since the duct work will be custom-made, EPA does not expect the use of metric units to be a problem. If you wish, convert the metric units to English units with the formula: meters x 3.281 = feet.

Basis of Standard

COMMENT: The proposed standards are not based on health-related criteria. Furthermore, since the proposal does not indicate the actual fluoride concentrations allowed, it is impossible to relate the standards to worker health criteria established by the National Institute for Occupational Safety and Health.

RESPONSE: The Clean Air Act requires standards of performance to reflect:

...the best technological system of continuous emission reduction which (taking into consideration the cost of achieving such emission reduction, any nonair quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated.

Note that the Act does not require health-related criteria to be considered. Nevertheless, public health and welfare were considered several years ago when EPA initially decided to control emissions of fluorides from primary aluminum plants. In particular, two studies on fluorides were considered. One, the March 1970 Report of the Secretary of Health, Education, and Welfare to the United States (91st) Congress, concluded that inorganic fluorides are highly irritant and toxic gases which, in low ambient concentrations, damage plants and animals. In this report fluorides were the only pollutants, other than the criteria pollutants (i.e., the pollutants for which National Ambient Air Quality Standards have been established), specifically named as requiring Federal action. The other study was the U.S. Senate Committee on Public Works' report on the Clean Air Amendments of 1970 (Senate Report No. 91-1196, September 17, 1970). This report included fluorides on a list of contaminants which have broad national impact and require Federal action. Additional information considered by EPA may be found in the document entitled, Background Information for Standards of Performance: Primary Aluminum Industry - Volume 1: Proposed Standards (EPA 450/2-74-020a), pp. xvii to xxii.

The standards are intended to limit emissions of fluorides from the plant itself and should not be related to worker health criteria. The regulation and Reference Methods 13A and 13B contain instructions for obtaining actual fluoride concentrations and converting to the units of the standards.

Characterization of Potroom Emissions

COMMENT: The definition of potroom emissions is incomplete in the proposed amendments. What are the chemical characteristics of these emissions?

RESPONSE: The proposed amendments do not contain the entire regulation, as promulgated on January 26, 1976 (41 FR 3826). The promulgated regulation defines "total fluorides" as:

...elemental fluorine and all fluoride compounds as measured by reference methods specified in [40 CFR 60.195] or by equivalent or alternative methods [see 40 CFR 60.8(b)].

The final amendments do not alter this definition. Fluorides are further characterized in Volume 1 of the background information document for the original standards (EPA 450/2-74-020a).

Number of Sampling Manifolds Required

COMMENT: Section 2.2.1 of Method 14 states, "[a] minimum of one manifold system shall be installed for each potroom group ..." The required number of manifolds is not clear for situations where a potroom group consists of two or more potroom segments ducted to a common control system. Is one sampling manifold required for each potroom segment; is one manifold (i.e., eight sampling nozzles) to be divided equally among the potroom segments; or is only one manifold to be installed in only one potroom segment?

RESPONSE: Only one sampling manifold is required for each potroom group. In situations where a potroom group consists of a group of potroom segments ducted to a common control system, the manifold would be installed in only one potroom segment. The manifold may not be

divided among potroom segments; however, additional sampling manifolds may be installed in the other segments, if desired.

When only one manifold is located in a potroom group, care must be taken to assure that operations are normal in the potroom segments where manifolds are not located, but which are ducted to the same control system. During normal operation, most pots will be in operation, no major upsets will occur, and the operating and maintenance procedures followed in each potroom segment, including the segment tested, will be the same. Otherwise, the emissions levels measured in the tested potroom segment may not be representative of emission levels in the other potroom segments.

3. ENVIRONMENTAL, ECONOMIC, AND ENERGY IMPACTS

The potential increase in fluoride emissions into the atmosphere resulting from the amendments is shown in Table 1. Although the table shows a slight increase in emission levels, EPA believes that this increase may be more than offset by the improved operating and maintenance procedures required by the monthly testing requirement. No other environmental impacts are associated with the amendments.

Monthly testing costs are shown in Table 2, and the economic and energy impacts of the amendments are shown in Table 3. The costs in Tables 2 and 3 are estimates and will vary somewhat according to labor costs and other variable economic factors. Nevertheless, it is apparent that the amendments will have an insignificant impact on the operating expenses of a new primary aluminum plant.

Table 1. FLUORIDE EMISSIONS FROM A
NEW PRIMARY ALUMINIUM PLANT

Fluoride Emissions: ¹	<u>Mg/yr</u>	<u>(ton/yr)</u>
Without Amendments ²	105	(114)
With Amendments ³	105-138	(114-150)
Difference	0-33	(0-36)

¹It is assumed that the average capacity of a new plant is 110,000 Mg/yr (120,000 tons/yr).

²If the amendments were not developed, fluoride emissions would be limited to 0.95 kg/Mg (1.9 lb/ton).

³The amendments will limit fluoride emissions from prebake plants to between 0.95 and 1.25 kg/Mg (1.9 and 2.5 lb/ton). New plants are expected to be of the prebake design.

Table 2. PERFORMANCE TEST COSTS FOR A
NEW PRIMARY ALUMINUM PLANT
(1979 DOLLARS)

Cost for Single Test: ¹	<u>First Year</u>	<u>Succeeding Years</u>
Primary Emissions	\$4200	\$4200
Secondary Emissions	5100	5100
Bake Plant Emissions	4200	4200
Annual Costs: ²		
Primary Emissions	\$134,400	\$ 67,200
Secondary Emissions	244,800	244,800
Bake Plant Emissions	<u>33,600</u>	<u>16,800</u>
Total	\$412,800	\$328,800

¹The following assumptions are made: each performance test consists of the average of three 24-hour test runs; testing is performed by two crews of plant personnel working 13-hour shifts; emissions from the primary control system are ducted to a single stack; each affected facility (i.e., potroom group) has only one secondary emissions sampling manifold; the plant consists of four affected facilities and one anode bake plant.

²It is assumed that after six months of operation of the plant an alternative sampling program is approved for primary control system and bake plant testing. The alternative program requires quarterly testing. (These assumptions are necessary for making the cost estimates, but are not intended to represent EPA policy. The alternative sampling program is to be determined on a case-by-case basis.)

Table 3. ECONOMIC AND ENERGY IMPACTS
OF THE AMENDMENTS ON A NEW
PRIMARY ALUMINUM PLANT

Increase In: ¹	First Year	Succeeding Years
Capital Costs ²	\$2500	\$2500
Annualized Costs ³	\$415,000 (<0.5%)	\$330,000 (<0.4%)
Energy Consumption	0	0

¹It is assumed that the plant consists of four affected facilities (i.e., potroom groups) and one anode bake plant.

²It is assumed that two test anemometers will be located in each affected facility and that the anemometers will be replaced yearly. (Actually, it is unlikely that each anemometer will need to be replaced every year; however, some plant operators may choose to do so rather than to check the anemometers' performance, as would otherwise be required.) These costs are only intended to represent investments incurred by the amendments and do not cover items which would otherwise be required by the original regulation (e.g., the sampling manifold).

³It is estimated that the amendments would cause annualized costs to increase by about 0.45 percent (0.25¢/lb) during the first year and about 0.35 percent (0.20¢/lb) during succeeding years of operation of a new plant, based on the February 1979 selling price of aluminum of 53¢/lb. It is unlikely that all of these costs will be passed directly to the consumer. Thus, commercial aluminum prices are likely to rise less than the percentages given.